

REMARKS

The Office Action mailed April 4, 2011 has been carefully reviewed, and the foregoing amendment and the following remarks have been made in consequence thereof.

Claims 1-34 are pending in this application. Claims 1-14 and 28-30 stand rejected. Claims 15-27 have been withdrawn from consideration by the Examiner. Claims 31-34 are newly added.

A fee calculation sheet for the newly added claims along with authorization to charge a deposit account in the amount of the calculated fee is submitted herewith.

Claim Rejection – 35 U.S.C. § 102(b)

The rejection of Claims 28-30 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,662,031 to Qin et al. (“Qin”) is respectfully traversed.

Qin describes a processor (400) that has a first electrode (401) and a second electrode (402) each including a convex face region or dome (408). An electrode spacer (420) forms a cylindrical treatment zone passage (430) between the first electrode (401) and the second electrode (402). Qin also describes a processor (110) with a first electrode (131) centrally located and a second electrode (132) arranged around the first electrode (131). The treatment zone faces of the first electrode (131) and the second electrode (132) **are longitudinally scalloped**. The undulating treatment faces of the first electrode (131) and the second electrode (132) induce additional agitation in the fluid being processed.

Notably, Qin does not describe a biconcave treatment zone as recited in each of independent Claims 1, 28 and 30. Further, as admitted on page 5 of the Office Action, Qin does not describe ellipsoidal electrode surface sections as recited in new claims 31-33.

It is suggested on page 3 of the Office Action that the “Qin patent discloses a device for treating a fluid comprising . . . a biconcave treatment zone for treatment of the fluid....” However, as recited above, at no point does Qin teach or suggest a biconcave treatment zone. In contrast, Qin teaches that the “treatment zone complementary electrode faces are provided with a longitudinally scalloped face shape.” (column 5, lines 51-53) Accordingly, Qin teaches a treatment zone that comprises sequence of alternating biconcave and biconvex

regions through which the flowable food product must pass. Therefore, there is no teaching or suggestion in Qin of a biconcave treatment zone. Although the treatment zone includes sections that are biconcave, without the benefit the Applicant's teaching, there is nothing in Qin to suggest to a person of ordinary skill in the art that only the biconcave portion of the treatment zone can provide the treatment zone.

In fact, Qin teaches away from the idea that the treatment zone is a biconcave treatment zone and states that "the undulating electrode surfaces induce additional agitation in the fluid being processed. This is believe to have beneficial effects on microbial inactivation." (column 5, lines 65-67)

In comparison to the biconcave treatment zone defined in the instant application, the scalloped configuration of the electrodes in Qin may increase the likelihood of eddy currents developing in the portions of the treatment zone where the electrode surfaces are spaced farthest apart, thereby limiting the maximum flow rate of fluid that can pass through the treatment zone. Yet further, the agitation of the fluid, described as beneficial in Qin, increases the likelihood of frothing or bubble production in the fluid. As a result, there is an increased propensity for electrical discharge between the electrodes of Qin. Yet further, the geometry used in Qin has a high potential of contamination problems due to the long co-axial geometry, where the fluid can stagnate creating a "dead zone". The potential for eddy currents and dead zones would likely reduce the chances that the treatment zone described in Qin would meet sanitation standards.

Accordingly, upon a reading of Qin and nothing more, a person of ordinary skill in the art would be led to believe that the scalloped shaped electrodes are desired to improve the treatment of the fluid. There is nothing in Qin that would lead such a person to the conclusion that replacing the scallop-shaped electrodes with concave electrodes, thereby reducing the agitation, may actually improve performance.

Accordingly, given the improvement of the claimed invention as compared to Qin, it is submitted that a person of ordinary skill in the art would not be able arrive at a biconcave treatment zone, as defined in Claims 1, 28, and 30, without an inventive step or the hindsight benefit of Applicants' disclosure.

Claim 28 recites a pasteurization kit for treating a fluid comprising "at least two electrodes for generating an electric field therebetween, the electrodes having convex

electrode surface sections configured such that when assembled in a housing, the convex electrode surface sections oppose each other and define therebetween a biconcave treatment zone for treatment of the fluid, and one of the electrodes is configured such that the fluid will circumfuse its surface in order to be introduced into the treatment zone.”

Qin does not describe or suggest a pasteurization kit as recited in Claim 28. More specifically, Qin does not describe or suggest at least two electrodes having opposing convex electrode surface sections configured to oppose each other and define therebetween a biconcave treatment zone for treatment of the fluid. Rather, Qin describes a processor that includes a first electrode and a second electrode that each have a longitudinally scalloped treatment zone face.

Accordingly, Claim 28 is submitted to be patentable over Qin.

Claim 29 depends from independent Claim 28. When the recitations of dependent Claim 29 are considered in combination with the recitations of Claim 28, Applicants respectfully submit that Claim 29 likewise is patentable over Qin.

Claim 30 recites a fluid treatment chamber for use in the inactivation of microorganisms in fluids that comprises “an electrode assembly having at least two electrodes, the electrodes having opposing convex electrode surface sections forming an electrode gap consisting of a biconcave treatment zone wherein there is simultaneously produced: a most intense electric field generated by the electrode assembly at its midsection . . . a substantially uniform electric field per unit cross section of the treatment zone . . . and a smooth continuous decrease in intensity of electric field in either direction away from the mid section of the treatment zone by the application of a voltage pulse.”

Qin does not describe or suggest a fluid treatment chamber as recited in Claim 30. More specifically, Qin does not describe or suggest an electrode assembly that includes at least two electrodes having opposing convex surface sections forming an electrode gap consisting of a biconcave treatment zone. Rather, Qin describes a processor that includes a first electrode and a second electrode that each have a longitudinally scalloped treatment zone face.

Accordingly, Claim 30 is submitted to be patentable over Qin.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 28-30 be withdrawn.

Claim Rejections – 35 U.S.C. § 103(a)

The rejection of Claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over Qin in view of U.S. Patent No. 3,691,050 to Sayre is respectfully traversed.

Qin is described above.

Sayre describes an electric field water purification system that includes an upper electrode (66) and a lower electrode (75). The upper electrode (66) includes a ring of conductive material that is mounted adjacent to a tube (58). The lower electrode (75) is located in a reservoir below the tube (58), and includes a metallic liquid, such as mercury. The water purification system may be a gravity fed system. Notably, Sayre does not describe or suggest a biconcave treatment zone.

Claim 1 recites a treatment chamber for deactivating microorganisms in a fluid, the treatment chamber comprising “a housing comprising a fluid inlet for receiving fluid to be treated and a fluid outlet for allowing treated fluid to be retrieved . . . and an electrode assembly within the housing, the electrode assembly comprising at least two electrodes having opposing convex electrode surface sections for forming an electrode gap therebetween, and wherein a continuous and substantially uniform electric field per unit cross section is generated by the application of a voltage pulse . . . the electrode gap defining a biconcave treatment zone through which the fluid, under influence of gravity, flows in a steady, uniform, non-turbulent manner, the treatment zone including the most intense electric field generated by the electrode assembly for treatment of the fluid and where at least one of the opposing electrode surfaces controls the spatial distribution and dynamics of the flow of the fluid to be treated within the treatment zone.”

Neither Qin nor Sayre, considered alone or in combination, describes or suggests a treatment chamber as recited in Claim 1. More specifically, neither Qin nor Sayre, considered alone or in combination, describes or suggests an electrode assembly that includes, *inter alia*, an electrode gap defining a **biconcave treatment zone** through which the fluid, under influence of gravity, flows in a steady, uniform, non-turbulent manner. Rather, as described above, Qin describes a processor that includes a first electrode and a second

electrode that each have a longitudinally scalloped treatment zone face, and Sayre describes a gravity fed purification system that includes an upper electrode and a lower electrode.

Accordingly, Claim 1 is submitted to be patentable over Qin in view of Sayre.

Claims 2-9 depend from independent Claim 1. When the recitations of dependent Claims 2-9 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 2-9 likewise are patentable over Qin in view of Sayre.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1-9 be withdrawn.

The rejection of Claims 10-14 under 35 U.S.C. § 103(a) as being unpatentable over Qin in view of Sayre, and further in view of U.S. Patent No. 2,192,249 to White is respectfully traversed.

Qin and Sayre are described above.

White describes an electrode precipitator encased in a cylindrical housing (4). The precipitator includes a tubular electrode member (13) adapted to accommodate a stream of gas flowing therethrough. The tubular electrode member (13) surrounds a central electrode assembly that includes a lower part having a fine wire discharge electrode (26) and an upper part having an extended surface electrode. The fine wire discharge electrode (26) creates an ionizing field in cooperation with the surrounding tubular electrode member (13). Notably, White does not describe or suggest a biconcave treatment zone.

Claims 10-14 depend from independent Claim 1, which is recited above.

None of Qin, Sayre, and White, considered alone or in combination, describes or suggests a treatment chamber as recited in Claim 1. More specifically, none of Qin, Sayre, and White, considered alone or in combination, describes or suggests an electrode assembly that includes that includes, *inter alia*, an electrode gap defining a **biconcave treatment zone** through which the fluid, under influence of gravity, flows in a steady, uniform, non-turbulent manner. Rather, Qin describes a processor that includes a first electrode and a second electrode that each have a longitudinally scalloped treatment zone face, Sayre describes a gravity fed purification system that includes an upper electrode and a lower electrode, and

White describes an electrode precipitator that includes a tubular electrode member surrounding a central electrode assembly.

Accordingly, Claim 1 is submitted to be patentable over Qin in view of Sayre, and further in view of White.

Claims 10-14 depend from independent Claim 1. When the recitations of dependent Claims 10-14 are considered in combination with the recitations of Claim 1, Applicants respectfully submit that Claims 10-14 likewise are patentable over Qin in view of Sayre, and further in view of White.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 10-14 be withdrawn.

Further, new claims 31-33 recite the further limitation that at least one of the convex electrode surface sections is ellipsoidal.

Applicants respectfully traverse the assertion made at page 5 of the Office Action that “[s]uch modification to shape has been well settled to have been within the purview of the ordinary artisan.” Notably, in electric field fluid treatment chambers, such as the present invention, the shape of the electrode surfaces determines the properties of the electric field generated therein. For example, at column 5, lines 42-45, referring to the processor (110), Qin describes that “treatment zone faces are contoured to provide a treatment zone in which the electrical field strength varies between relatively high values and relatively lower values.” As such, modifying the contours of the treatment zone faces in Qin would distinctly modify the properties of the electric field generated in the processor (110). Accordingly, modifying the treatment zone faces in Qin to be ellipsoidal would not merely be “within the purview of the ordinary artisan.” Thus, Qin does not describe or suggest at least two electrodes having opposing convex electrode surface sections, wherein at least one of the convex electrode surface sections is ellipsoidal. Such a deficiency is not remedied by either Sayre or White, either alone or in combination.

Conclusion

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Respectfully submitted,



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